

Appendix G

COMMON ERROR PRECURSOR DESCRIPTIONS

The first eight error precursors from the table on the previous pages are described below. These tend to be the more commonly encountered conditions that provoke errors. The error precursors for each category are arranged in order of influence.

Task Demands	Description
Time pressure (in a hurry)	Urgency or excessive pace required to perform action or task Manifested by shortcuts, being in a hurry, and an unwillingness to accept additional work or to help others No spare time
High workload (high memory requirements)	Mental demands on individual to maintain high levels of concentration; for example, scanning, interpreting, deciding, while requiring recall of excessive amounts of information (either from training or earlier in the task)
Simultaneous, multiple tasks	Performance of two or more activities, either mentally or physically, that may result in divided attention, mental overload, or reduced vigilance on one or the other task
Repetitive actions / Monotony	Inadequate level of mental activity resulting from performance of repeated actions; boring Insufficient information exchange at the job site to help individual reach and maintain an acceptable level of alertness
Irrecoverable acts	Action that, once taken, cannot be recovered without some significant delay No obvious means of reversing an action
Interpretation requirements	Situations requiring "in-field" diagnosis, potentially leading to misunderstanding or application of wrong rule or procedure
Unclear goals, roles, & responsibilities	Unclear work objectives or expectations Uncertainty about the duties an individual is responsible for in a task that involve other individuals Duties that are incompatible with other individuals
Lack of or unclear standards	Ambiguity or misunderstanding about acceptable behaviors or results; if unspecified, standards default to those of the front-line worker (good or bad)

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Work Environment	Description
Distractions / Interruptions	Conditions of either the task or work environment requiring the individual to stop and restart a task sequence, diverting attention to and from the task at hand
Changes / Departure from routine	Departure from a well-established routine Unfamiliar or unforeseen task or job site conditions that potentially disturb an individual's understanding of a task or equipment status
Confusing displays / controls	Characteristics of installed displays and controls that could possibly confuse or exceed working memory capability of an individual Examples: <ul style="list-style-type: none"> • missing or vague content (insufficient or irrelevant) • lack of indication of specific process parameter • illogical organization and/or layout • insufficient identification of displayed process information • controls placed close together without obvious ways to discriminate conflicts between indications
Work-arounds / Out-of-Service instrumentation	Uncorrected equipment deficiency or programmatic defect requiring compensatory or non-standard action to comply with a requirement; long-term materiel condition problems that place a burden on the individual
Hidden system response	System response invisible to individual after manipulation Lack of information conveyed to individual that previous action had any influence on the equipment or system
Unexpected equipment condition	System or equipment status not normally encountered creating an unfamiliar situation for the individual
Lack of alternative indication	Inability to compare or confirm information about system or equipment state because of the absence of instrumentation
Personality conflict	Incompatibility between two or more individuals working together on a task causing a distraction from the task because of preoccupation with personal differences

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Individual Capabilities	Description
Unfamiliarity with task / First time	Unawareness of task expectations or performance standards First time to perform a task (not performed previously; a significant procedure change)
Lack of knowledge (mental model)	Unawareness of factual information necessary for successful completion of task; lack of practical knowledge about the performance of a task
New technique not used before	Lack of knowledge or skill with a specific work method required to perform a task
Imprecise communication habits	Communication habits or means that do not enhance accurate understanding by all members involved in an exchange of information
Lack of proficiency / Inexperience	Degradation of knowledge or skill with a task because of infrequent performance of the activity
Indistinct problem-solving skills	Unsystematic response to unfamiliar situations; inability to develop strategies to resolve problem scenarios without excessive use of trial-and-error or reliance on previously successful solutions Unable to cope with changing plant conditions
"Unsafe" attitude for critical tasks	Personal belief in prevailing importance of accomplishing the task (production) without consciously considering associated hazards Perception of invulnerability while performing a particular task Pride; heroic; fatalistic; summit fever; Pollyanna; bald tire
Illness / Fatigue	Degradation of a person's physical or mental abilities caused by a sickness, disease, or debilitating injury Lack of adequate physical rest to support acceptable mental alertness and function

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Human Nature	Description
Stress	<p>Mind's response to the perception of a threat to one's health, safety, self-esteem, or livelihood if task is not performed to standard</p> <p>Responses may involve anxiety, degradation in attention, reduction in working memory, poor decision-making, transition from accurate to fast</p> <p>Degree of stress reaction dependent on individual's experience with task</p>
Habit patterns	<p>Ingrained or automated pattern of actions attributable to repetitive nature of a well-practiced task</p> <p>Inclination formed for particular train/unit because of similarity to past situations or recent work experience</p>
Assumptions	<p>Suppositions made without verification of facts, usually based on perception of recent experience; provoked by inaccurate mental model</p> <p>Believed to be fact</p> <p>Stimulated by inability of human mind to perceive all facts pertinent to a decision</p>
Complacency / Overconfidence	<p>A "Pollyanna" effect leading to a presumption that all is well in the world and that everything is ordered as expected</p> <p>Self-satisfaction or overconfidence, with a situation unaware of actual hazards or dangers; particularly evident after 7-9 years on the job</p> <p>Underestimating the difficulty or complexity of a task based upon past experiences</p>
Mind-set	<p>Tendency to "see" only what the mind is <i>tuned</i> to see (intention); preconceived idea</p> <p>Information that does fit a mind-set may not be noticed and vice versa; may miss information that is not expected or may see something that is not really there; contributes to difficulty in detecting one's own error (s)</p>
Inaccurate risk perception	<p>Personal appraisal of hazards and uncertainty based on either incomplete information or assumptions</p> <p>Unrecognized or inaccurate understanding of a potential consequence or danger</p> <p>Degree of risk-taking behavior based on individual's perception of possibility of error and understanding of consequences; more prevalent in males</p>

Human Nature	Description
Mental shortcuts (biases)	<p>Tendency to look for or see patterns in unfamiliar situations; application of thumbrules or “habits of mind” (heuristics) to explain unfamiliar situations:</p> <ul style="list-style-type: none"> • confirmation bias • frequency bias • similarity bias • availability bias
Limited short-term memory	<p>Forgetfulness; inability to accurately attend to more than 2 or 3 channels of information (or 5 to 9 bits of data) simultaneously</p> <p>The mind’s “workbench” for problem-solving and decision-making; the temporary, attention-demanding storeroom we use to remember new information</p>